Cells to Society: The Canadian Longitudinal Study on Aging

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The Canadian Longitudinal Study on Aging (CLSA)

- Strategic initiative of CIHR; on Canadian research agenda since 2001
- Team of 3 principal investigators, more than 160 co-investigators from 26 institutions
- Multidisciplinary - biology, genetics, medicine, psychology, sociology, demography, nursing, economics, epidemiology, nutrition, health services
- Largest study of its kind to date in Canada for breadth and depth: following 50,000 Canadians for 20 years
Overall Aims of the CLSA

- To examine aging as a dynamic process
- To investigate the inter-relationship among intrinsic and extrinsic factors from mid life to older age
- To address aging from cell to society
- To capture the transitions, trajectories and profiles of aging
- To provide infrastructure and build capacity for sustained high quality research on aging in Canada
**Study Overview**

50,000 women and men aged 45 - 85 at baseline

**Tracking Cohort**
- 20,000
- Randomly selected within Provinces

**Comprehensive Cohort**
- 30,000
- Randomly selected within 25-50 km of 11 sites

**Questionnaire**
- By telephone (CATI)
- In person, in home (CAPI)

**Clinical/physical tests**
- Blood, urine (optional)
- At Data Collection Site

**Interim contact, Follow up every 3 years**

**Data Linkage**
Representative Sample Frame for Recruitment

• Statistics Canada: CCHS 4.2 Healthy Aging Survey

• Health Ministries: Health Insurance Card registration databases

• Random Digit Dialing
Participants consent to participate in CLSA

Potential participants receive Study Information Package

Participants provide questionnaire data (n=50,000)

DATA COLLECTION SITE VISIT Physical/Psychological Data
- Neuropsychological Battery
- Performance Testing
- Anthropometric Measures
- Bone Density, Body Composition
- Aortic Calcification
- ECG, BP
- Carotid Intimal-Medial Thickness
- Pulmonary Function
- Vision and Hearing

Biological Data
- Blood
- Urine

COMPREHENSIVE n=30,000

Stored at Biorepository and Bioanalysis Centre (BBC)

STORED at (NCC/SAC)

Telephone interview

Questionnaire data processed

Home Interview

TRACKING n=20,000

Stored at (NCC/SAC)
Depth and Breadth of CLSA

- DEMOGRAPHIC
  - Education
  - Marital status
  - Ethnicity
- HEALTH BEHAVIOURS
  - Smoking, alcohol
  - Nutritional risk
  - Health care utilization
  - Medication use
  - Supplement use
- HEALTH STATUS
  - General health
  - Women’s health
  - Chronic conditions, symptoms
  - Oral health
- PHYSICAL
  - Injuries, falls
  - Physical activity
  - Pain, discomfort
  - Functional status
  - ADL, IADL
- PSYCHOLOGICAL
  - Cognition—Executive function, memory, psychomotor speed
  - Depression
  - Psychological distress
  - Veteran identifier
  - Satisfaction with life
  - PTSD
- SOCIAL
  - Social networks
  - Social support
  - Social participation
  - Online communication
  - Social inequality
  - Care receiving
  - Care giving
  - Retirement status
  - Labour force participation
  - Retirement planning
  - Transportation
  - Mobility, Migration
  - Built environments
  - Home ownership
At the Data Collection Site

**Reception**
- Sign in
- Bar code scan
- Contraindications Q

**Measurement Room 1**
- Height, weight
- Blood pressure
- Spirometry
- Carotid ultrasound cIMT
- ECG

**Measurement Room 2**
- DEXA
- BMD, body composition, aortic calcification

**Measurement Room 3**
- Visual acuity
- Fundus photograph
- Occular pressure
- Grip strength
- Neuropsych I
- Chronic Diseases Q

**Measurement Room 4**
- Hearing
- Neuropsych II

**Hallway**
- Timed Up and Go
- Four metre walk
- Balance

**Phlebotomy Lab**
- 50 ml Blood Draw

**Washroom**
- Urine Sample

**Check out**
- Review of results
- Snack
- Honorarium

**TOTAL TIME**
2.5 – 3 HRS
Bio specimen processing

42 aliquots per participant

- Basic hematological tests completed on site
- Remainder processed, frozen within 2 hrs
Biorepository and Bioanalysis Centre (BBC)

- 31 nitrogen tanks (5 million aliquots)
- Personal Archive, dry storage, humidity controlled, at room temperature
- LIMS (LabWare)
- CryoMORE, (Air Liquide) safety monitoring system
Milestones

- Past half way mark for recruitment, baseline data collection
- Coordinated REB process
- Automated quality assurance, quality control
- Data cleaning, coding process established
- Development of data dissemination protocol
- Collaborations with other large national initiatives
- ELSI protocols for identifying cognitive decline, proxy decision makers, proxy information providers, withdrawal options
Data and Sample Access

• Data and samples available to the research community

• Guiding principles
  • Rights and privacy of participants must be protected
  • Confidentiality and security of data must be safeguarded
  • Data and samples made available in timely manner
  • Data and samples can only be used for research purposes
  • No exclusive access
  • Cost neutral
Data and Sample Access: Process

- 20,000 Telephone Interviews: anticipate 1\textsuperscript{st} release of data Spring 2014
- 30,000 Data Collection Site Visits: anticipate 1\textsuperscript{st} release of data after baseline complete ~Spring 2016
- Application process via CLSA website portal
- Review: Administrative, Data and Sample Access Committee recommendation
- Approval, data/sample sharing agreements
- Return of derived variables to CLSA dataset
- Ancillary Studies (Studies that require additional data collection on all or subset of participants) in Wave 2
Upcoming areas of interest and development for the CLSA

- Planning and development underway for Wave 2
- Core biomarker analysis
- Structural and functional brain imaging
- Epigenetics
- Veteran’s health
- Environmental exposures
- Assistive technologies, accelerometry
- Coordinated linkage with administrative data bases
- Data sharing, including biological samples
- Data harmonization
CLSA by the numbers

- 50,000 participants
- 20 years to complete the study
- Up to 140,000 telephone interviews
- Up to 210,000 home interviews
- Up to 210,000 visits to data collection sites
- Up to 8,820,000 biospecimen aliquots
- Up to 300,000 follow-up calls
- Up to 129 million questions asked during telephone interviews
- Up to 219 million data points collected during CLSA home interviews and visits to data collection sites
- Up to 348 million data points will form the CLSA research platform
CLSA Site Leads
Data Collection Sites

- Debra Sheets, Lynn Young, Victoria
- Andrew Wister and Max Cynader, Vancouver
- David Hogan, Calgary
- Verena Menec, Winnipeg
- Parminder Raina, Hamilton
- Vaness Taler, Ottawa
- Christina Wolfson, Montreal
- Hélène Payette, Sherbrooke
- Susan Kirkland, Halifax
- Gerry Mugford, St. John’s
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www.clsa-elcv.ca